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A COMPARATIVE STRUCTURAL ANALYSIS OF TQM, ISO/TS16949 AND ORGANIZATIONAL PERFORMANCE BETWEEN MALAYSIAN AND THAILAND AUTOMOTIVE INDUSTRY

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4.1 INTRODUCTION

The implementation of quality management has not occurred at the same pace in different regions of the world. While early implementation started in Japan, US, Europe, and followed by the developing countries. To compete in the global market, these countries need to implement quality management practices, tools, and techniques within all sections of their industries. Despite the number of publications and quantity of research on TQM, little empirical work has been carried out in developing countries, particularly in the ASEAN region.

In the quest to standardize quality certification requirements, the automotive original equipment manufacturers (OEMs) have strongly suggested to their suppliers to obtain ISO/TS16949 registration. ISO/TS16949 is an ISO technical specification jointly developed by the International Automotive Task Force (IATF) and the ISO that serves as a common automotive quality system requirement catalog. This specification

aligns existing American (QS9000), German (VDAG.1), French (EAQF) and Italian (AVSQ) automotive quality systems standard within the global automotive industry.

But having a quality system in place and obtaining ISO/TS16949 registration does not necessarily assure organizational performance improvement. There is no guarantee of business after completing quality certification, but failure to do so may result in loss of business opportunities.

Given the importance of automotive industries to the Malaysian economy, the authors decided to evaluate the impact of ISO/TS16949 on the relationship between TQM and organizational performance.

4.2 LITERATURE REVIEW

In the early year of industrial development around 1960's, both Malaysia and Thailand adopted variations in the import substitution strategy of building their respective automotive industry, the two countries have exhibited remarkable differences in subsequent development paths. This section gives a historical background of the development of automotive industry in Malaysia and Thailand.

4.2.1 Overview of the Malaysian Automotive Industry

The development of automotive industry in Malaysia started since the 1980s. Although Malaysia made early attempts during 1960s and 1970s to create automotive industry aim at import substitution, competition amongst numerous assembly firms producing different models made it impossible for Malaysian auto industry to reap the benefits of the economies of scale (Fujita and Hill, 1997). In the early 1980s, the government launched a project to develop heavy industries. To spearhead this project, the government established the Heavy Industries Corporation of

Malaysia Berhad (HICOM). Two other national development objectives were formulated which played complementary roles in the heavy industrialization program. Under the first development objective called the "Look East Policy", the Prime Minister encouraged learning from Japan's work ethics. The other objective is raising the position of 'bumiputra' or native Malays. The government through HICOM tried to encourage Malays to participate in heavy industry regarding capital, employment, and management. Under the heavy industrialization project, the automotive industry became one of the targeted sectors for the Malaysian economy.

In 1983, Perusahaan Otomobil Nasional Berhad (Proton), a national car company, was established as a joint venture between HICOM, Mitsubishi Motor Corporation (MMC) and Mitsubishi Corporation (MC). The project is aimed at rationalizing and localizing the automotive industry. In 1990, the second national car project was announced. The second national car manufacturer, Perusahaan Otomobil Kedua Sdn. Bhd. (Perodua), was established as a joint venture between Malaysia firms and Daihatsu (MIDA, 1999). In short, Malaysia's automotive industry has been built around national car firms which depended on government support for capturing a large share of the domestic market.

The strategy to form a national car in Malaysia had followed a particular sequence (Dicken, 1998):

- Stage 1: Import of complete built-up (CBU) vehicles by distributors.
- Stage 2: Assembly of semi or completely knocked-down (CKD) vehicles by subsidiaries or licensed or franchised domestic companies, importing parts and components from the brand corporation.
- Stage 3: Assembly of CKD vehicles but with increasing local content.
- Stage 4: Full-scale of manufacturer of automobiles.

Currently, given the significant challenges facing the automotive industry, in particular globalization, liberalization and increasing competition issues, there is a need to probably review the strategic direction and policy for the domestic automotive sector. This is crucial in an effort to maintain the competitiveness of participants in the automotive sector, and in order for them to be viable in the long term.

4.2.2 Overview of the Thailand Automotive Industry

The emergence of automotive industry in Thailand dates back to the early 1960s. In 1962, the Board of Investment (BOI) provided incentives for automotive assembly plants to locate in the country (Panichapat and Kanasawat, 1997). This policy proved to be successful in attracting foreign investors from US, Japan, and Europe to set up joint ventures with Thai businesses. In 1971, the Automobile Development Committee, which had been established under the Ministry of Industry, announced a policy requiring progressive increases in localization ratios to 25% for passenger cars, 20% for commercial cars with windshields, and 15% for commercial cars without windshields by 1975 (Fujita, 1997).

The automotive industry in Thailand encountered difficulties during the period from the late 1970s to the mid-1980s. After 1987, the industry started to expand rapidly, led by rapid growth of the Thai economy. The early 1990s saw a drastic change in the policy towards liberalization of the auto industry. Officially, the policy shift was intended to strengthen international competitiveness of the industry by increasing competition amongst local producers who had enjoyed protection for long period, and also to benefit consumers by lowering car prices (Panichapat and Kanasawat, 1997). In 1991, the government lifted the ban on import of CBU passenger cars and the import duty rates on CKD kits were substantially reduced. In 1992, further tariff reductions were implemented on six important components

and materials. In 1993, the government announced approval for establishing new passenger vehicle assembly plants (Poapongsakorn and Fuller, 1998).

The automotive industry in Thailand has expanded continuously compared with the year 2002 (Limsavarn, 2007). Until now, the automobile car assembly companies and parts producers in Thailand have been protected from the three main policies such as:

- High rate of import tariff
- Protected and controlled import
- Investment promotion

At present, the booming industry has returned to the glory days seen before the 1997 financial crisis and now nearly all of the world's major manufactures such as Ford, Nissan, and Toyota have assembly operations in Thailand. Thailand had outlined a policy to further promote automotive parts manufacturing by offering support in the form of credit lines extended by state-sponsored financial institutions, as part of the policy to turn Thailand into the "Detroit of Asia".

4.2.3 TQM Constructs

TQM constructs have been investigated extensively (Saraph *et al.*, 1989, Flynn *et al.*, 1994, Ahire *et al.*, 1996, Rao *et al.*, 1999, Yusof and Aspinwall, 2000 and Sila, 2007). To generate distinct generic construct, first define a list of others constructs proposed in a large set of articles. Then, each construct was analyzed whether it was different or similar to the constructs previously analyzed. This process resulted with the eight following constructs: quality leadership, customer focus and satisfaction, quality information and analysis, human resource development, strategic planning management, quality results, and quality assurance. Table 4.1 presents a list of similar practices proposed

by other authors on all the constructs.

Table 4.1 A constructs proposed by literature

Constructs	Related constructs
Quality leadership (QL)	The role of top management leadership (Saraph <i>et al.</i> , 1989), top management support (Flynn <i>et al.</i> , 1994), top management commitment (Ahire <i>et al.</i> , 1996), management leadership (Yusof and Aspinwall, 2000), leadership (Sila, 2007)
Customer focus and satisfaction (CFS)	The role of quality department (Saraph <i>et al.</i> , 1989), customer involvement (Flynn <i>et al.</i> , 1994), customer focus (Ahire <i>et al.</i> , 1996), customer orientation (Rao <i>et al.</i> , 1999)
Quality information and analysis (QIA)	Quality data and reporting (Saraph <i>et al.</i> , 1989), quality information (Flynn <i>et al.</i> , 1994), quality information and availability (Ahire <i>et al.</i> , 1996), information and analysis (Sila, 2007).
Human resource development (HRD)	Workforce management (Flynn <i>et al.</i> , 1994), employee training (Ahire <i>et al.</i> , 1996), support for human resource development (Sila, 2007), human resource management (Parast <i>et al.</i> , 2006).
Strategic planning management (SPM)	Process design management (Saraph <i>et al.</i> , 1989), process management (Flynn <i>et al.</i> , 1994), design quality management (Ahire <i>et al.</i> , 1996), strategic planning process of quality management (Parast <i>et al.</i> , 2006).
Supplier quality management (SQM)	Supplier involvement (Flynn <i>et al.</i> , 1994), supplier quality management (Ahire <i>et al.</i> , 1996), supplier quality (Rao <i>et al.</i> , 1999, Parast <i>et al.</i> , 2006), supplier quality assurance (Yusof and Aspinwall, 2000), supplier management (Sila, 2007).
Quality results (QR)	Product quality (Ahire <i>et al.</i> , 1996), internal quality results (Rao <i>et al.</i> , 1999), quality results (Parast <i>et al.</i> , 2006), organizational effectiveness (Sila, 2007).
Quality assurance (QA)	Supplier quality assurance (Yusof and Aspinwall, 2000), quality assurance of products and service (Rao <i>et al.</i> , 1999).

4.2.4 Organizational Performance Measures

A review of past empirical studies on organizational performance also indicates that there are variations in measuring performance in organizations (Monge *et al.*, 2006). Different variables used for measuring organizational performance have been identified from the literature as shown in Table 4.2. Projogo and Sohal (2004) measured organizational performance from quality performance

(e.g. reliability, performance, durability and conformance to specification) and innovation performance (e.g. product and process innovation).

In this study, organizational performance will be measured in two categories, which is satisfaction level, and business result following Lin *et al.* (2005) because their findings were comprehensive and widely used by other researchers. Satisfaction level defined in organizational performance comprised of two items namely, employee satisfaction, and customer satisfaction. While business results for organizational performance comprised four items: productivity, number of successful new product, cost performance, and profitability.

Table 4.2 Performance measures proposed by literature

Author(s)	Measure	Variables
Lin <i>et al.</i> (2005)	Organizational performance	<ul style="list-style-type: none"> • Satisfaction level • Business result
Projogo and Sohal (2004)	Organizational performance	<ul style="list-style-type: none"> • Quality performance • Innovation performance
Jun <i>et al.</i> (2006)	Human resource performance measure	<ul style="list-style-type: none"> • Employee satisfaction • Employee loyalty
Sila (2007)	Performance measure	<ul style="list-style-type: none"> • Organizational effectiveness • Financial results • Market results
Lakhal <i>et al.</i> (2006)	Organizational performance	<ul style="list-style-type: none"> • Financial performance • Operational performance • Product quality

4.2.5 ISO/TS16949

ISO/TS16949:2002 is an ISO technical specification that represents a comprehensive quality management system for the global automotive industry to achieve world class levels of product quality, productivity, competitiveness and continual

improvements. It was clear from its inception that ISO/TS16949:2002 was different than its predecessor, QS 9000, for many reasons. For instance the performance requirements for the supply chain were different, and there were many changes in the accreditation and certification body scheme. Table 4.3 shows the measurement items for ISO/TS16949 efforts.

Table 4.3 ISO/TS16949 efforts and their measurement items

ISO/TS16949	Items	Reference/Authors
Control Plan (CP)	<ol style="list-style-type: none"> 1. Prototype 2. Pre-launch 3. Production 	International Automotive Task Force, Technical Specification ISO/TS16949 (2002)
Management Tools and Techniques (MTT)	<ol style="list-style-type: none"> 1. Quality management tools 2. Policy deployment and planning tools 3. Process design tools 4. Process analysis tools 	International Automotive Task Force, Technical Specification ISO/TS16949 (2002); Kartha (2004); Collin and Peach (2005)
Improvement Activity (ImpAct)	<ol style="list-style-type: none"> 1. Continual improvement 2. Corrective action 3. Preventive action 	International Automotive Task Force, Technical Specification ISO/TS16949 (2002).
Internal Audit (IntAud)	<ol style="list-style-type: none"> 1. Quality management system audit 2. Manufacturing process audit 3. Product audit 4. Internal auditor qualification 	International Automotive Task Force, Technical Specification ISO/TS16949 (2002); Munro (2004)

4.3 RESEARCH FINDINGS

In this study, two structural model has been proposed to model the relationship between TQM practices, ISO/TS16949 and organizational performance which are as follows:

- i. Moderator structural model
- ii. Mediator structural model

4.3.1 Moderator Structural Model

The structural equation modeling (SEM) approach and multi-group analysis was applied to test the proposed model and the effect of ISO/TS16949 certification for Malaysian and Thailand automotive industry as shown in Figure 4.1. The structural equation modeling approach is a multivariate statistical technique for testing structural theory (Tan, 2001). This approach incorporates both observed and latent variables.

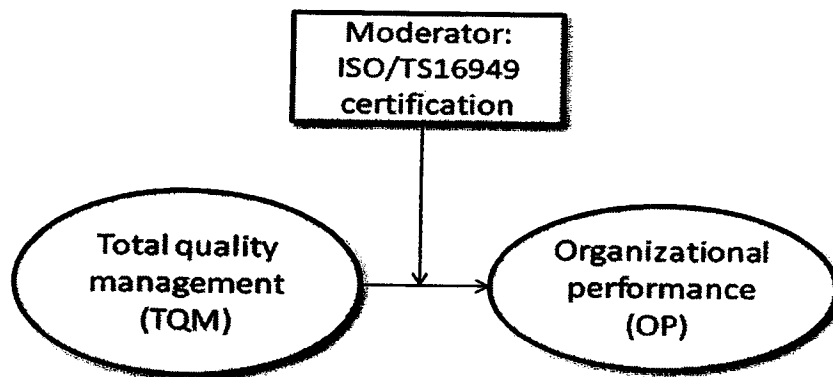


Figure 4.1 Research model – Moderator

The analysis for this study was conducted using AMOS 16.0 and utilizing the maximum likelihood method. TQM is considered exogenous variables, and organizational performance (OP) is considered an endogenous variable. Organizational performance (OP) was measured by two constructs: LS and BR. Based on components from the total quality management, seven constructs which measures the TQM latent variable were QL, SQM, QIA, CFS, QRA, HRD, and SPM. In order to corroborate ISO/TS16949 certification moderating effect on TQM and organizational performance (OP) relationship, the researcher separated the samples into two groups – Malaysia and Thailand.

In trying to determine the relationship between TQM and

organizational performance (OP) is moderated by ISO/TS16949 certification, analysis was conducted between “None ISO/TS16949 certification companies” and ISO/TS16949 certification companies” among Malaysian and Thailand automotive industries with the hypotheses *H1* and *H2* being set up.

H1: ISO/TS16949 certification will moderate the relationship between TQM and organizational performance (OP) in Malaysia

H2: ISO/TS16949 certification will moderate the relationship between TQM and organizational performance (OP) in Thailand

Based on the results as summarized in Tables 4.4 and 4.5, it show that ISO/TS16949 certifications do not significantly moderate the relationship between TQM and organizational performance in Malaysian and Thailand automotive industries. It is different with authors predictions in *H1* and *H2*, ISO/TS16949 certification do moderate the link between TQM and organizational performance. Due to limitations of research on ISO/TS16949, the authors will discussed the previous studies based on quality system such as ISO series.

This research findings support Terziovski *et al.* (2003) findings that ISO 9000 certification does not have positive impact on organizational performance. The results of this study also agree with Anderson *et al.* (1999) who indicated that quality systems and regulatory compliance are not the only reasons for the widespread adoption of ISO 9000 in North American manufacturing companies. They found that managers adopt ISO 9000 as a means of achieving quality improvement and global competitiveness. Sun (2000) found that TQM implementation cannot guarantee enhanced performance, however ISO certification are partially related to TQM which lead to

improvement in business performance.

Table 4.4 The structural relationship of TQM and OP for Malaysian automotive industries

No	Structural model	p-value
1.	<p>None ISO/TS16949 Companies</p> <p>Chi-Square= 34.740 df= 22, p-value= .041 Chi-Square/df= 1.579 GFI= .928 AGFI= .848 CFI= .989 TLI= .949 RMSEA= .077 PCFI= .992 AIC= 80.740</p>	0.000
2.	<p>ISO/TS16949 Companies</p> <p>Chi-Square= 32.388 df= 24, p-value= .118 Chi-Square/df= 1.349 GFI= .889 AGFI= .791 CFI= .988 TLI= .948 RMSEA= .079 PCFI= .844 AIC= 74.388</p>	0.000

Table 4.5 The structural relationship of TQM and OP for Thailand automotive industries

No	Structural model	p-value
1.	<p>None ISO/TS16949 Companies</p> <p>Chi-Square= 33.489 df= 27, p-value= .182 Chi-Square/df= 1.240 GFI= .868 AGFI= .779 CFI= .971 TLJ= .981 RMSEA= .078 PCFI= .728 AIC= 69.489</p>	0.000
2.	<p>ISO/TS16949 Companies</p> <p>Chi-Square= 36.033 df= 28, p-value= .091 Chi-Square/df= 1.388 GFI= .931 AGFI= .881 CFI= .978 TLJ= .989 RMSEA= .062 PCFI= .706 AIC= 74.033</p>	0.000

Research into the relationship between TQM, ISO certification and the performance of organizations is scarce. One setback of quality systems certification is that a company may

regard certification as a substitute for TQM and does not continue the journey after being registered to ISO/TS16949. Tsiotras and Gotzamani (1996) also warned that quality standards alone must not be the aim of an organization. The ultimate target must be the development of a strong total quality system which will lead to the future development.

Based on the results of this study, the authors believe that ISO/TS16949 certification can contribute to organizational performance if a climate of change is created. However, this is not yet happening on a widespread basis. ISO/TS16949 certification may act as a foundation on which to build a quality organization where it is implemented as part of the TQM philosophy and methods.

Based on the authors' observation, ISO/TS16949 certification is not popular in Malaysia as compared to Thailand. It is supported with data from survey respondents where only 57 companies had ISO/TS16949 certification in place while 99 companies are not certified to ISO/TS16949 in Malaysia. Although, ISO/TS16949 certification do not moderate significantly in TQM and organizational performance relationship in both countries, it is important to examine the results on an overall perspective. Referring to the standardized regression weight, there is a difference between the two countries as shown in Table 4.6.

Table 4.6 Summary results on moderating effect

	Malaysia		Thailand	
	No. of respondents	Standardized regression	No. of respondents	Standardized regression
None ISO/TS16949 certification	99	0.744	43	0.717
ISO/TS16949 certification	57	0.771	103	0.860
Difference	-	0.027	-	0.143

The standardized regression weight values show, the difference for Malaysia companies without and with ISO/TS16949 certification is about the same (0.027). Mean while,

for Thailand, the difference of standardized regression weight is 0.143. Both countries show the performance of companies with ISO/TS16949 certification higher when compared to performance of none ISO/TS16949 companies. It is believed that organizational performance for ISO/TS16949 certified companies are higher than those not certified with ISO/TS16949. In this study, ISO/TS16949 certified Thailand automotive companies show better impact to the organizational performance when compared to Malaysian automotive companies.

This concurs with some previous studies on the impact of ISO series on firm performance and the relationships among these practices. Dick (2000) found that the conformation and application of standardized quality systems models (ISO) in business is considered one of the most important recent phenomena in quality management development and firm performance. Najmi and Kehoe (2000) claimed that, the ISO series provide an important initial step towards quality development and the significant factors are continuous improvement activity program. Indeed, certification is just the beginning of the ISO process, what cannot be ignored is that the firm must continue with its internal audits, and corrective actions (Lin and Jang, 2008). Thus, it is believed that ISO/TS16949 certification is important for organizational performance improvement.

4.3.2 Mediator Structural Model

Earlier studies of TQM and performance focused on a number of mediating factors which include motivation, innovation, firm effectiveness, and ISO 9000 (Langerak, 2002). According to Baron and Kenny (1986), a mediating variable is “the generative mechanism through which the focal independent variable is able to influence the dependent variable of interest”. Mediating variables have also been depicted as a ‘go between’ that can link other variables on a path (Polit, 1996). A similar theoretical

definition describes mediators as intervening variables that can transmit an effect from one variable to another (Finney, 1995).

At present, the empirical support for mediating role of ISO/TS16949 efforts in the context of the relationship between TQM and organizational performance is hardly found. In the case of automotive industry, ISO/TS16949 may mediate between TQM and organizational performance. This discussion leads to the following hypotheses:

H3: There is a positive and direct strong relationship between TQM implementation and organizational performance of automotive industry in:

H3a: Malaysia

H3b: Thailand

H4: There is a positive and direct strong relationship between TQM implementation and ISO/TS16949 efforts of automotive industry in:

H4a: Malaysia

H4b: Thailand

H5: There is a positive and direct strong relationship between ISO/TS16949 efforts and organizational performance of automotive industry in:

H5a: Malaysia

H5b: Thailand

H6: The impact of TQM implementation on organizational performance increases with a mediating role of ISO/TS16949 efforts of automotive industry in:

H6a: Malaysia

H6b: Thailand

These theoretical discussions and proposed hypothesized relationships are delineated in the following research model, as shown in Figure 4.2. In order to corroborate ISO/TS16949 efforts mediate on TQM and organizational performance (OP) relationship, we separated the study samples into two groups – Malaysia and Thailand.

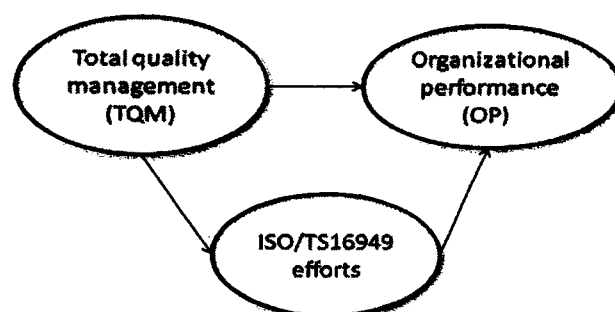


Figure 4.2 Research model – mediator

The structural relationships in the structural models were used to test the mediating effect hypotheses in this study as shown in Table 4.7. As discussed earlier, the structural models were valid for both countries, Malaysia and Thailand. Table 6.2 shows that relationship between TQM and organizational performance for Malaysia and Thailand automotive industries were found to be positive and significant, confirming that TQM implementation had a strong positive direct impact on the organizational performance. The finding that there is a direct effect relationship between TQM implementation and organizational performance corroborates with the findings of some previous studies (Ahire and Golhar, 1996; Hendricks and Singhal, 2001; Demirbag *et al.*, 2006). Table 4.8 also presents the relationship between TQM implementation and ISO/TS16949 efforts. The findings indicate that TQM implementation had a positive and strong direct impact on ISO/TS16949 efforts.

Table 4.7 The structural relationship between TQM and OP with a mediation of ISO/TS16949 efforts for Malaysian and Thailand automotive industries

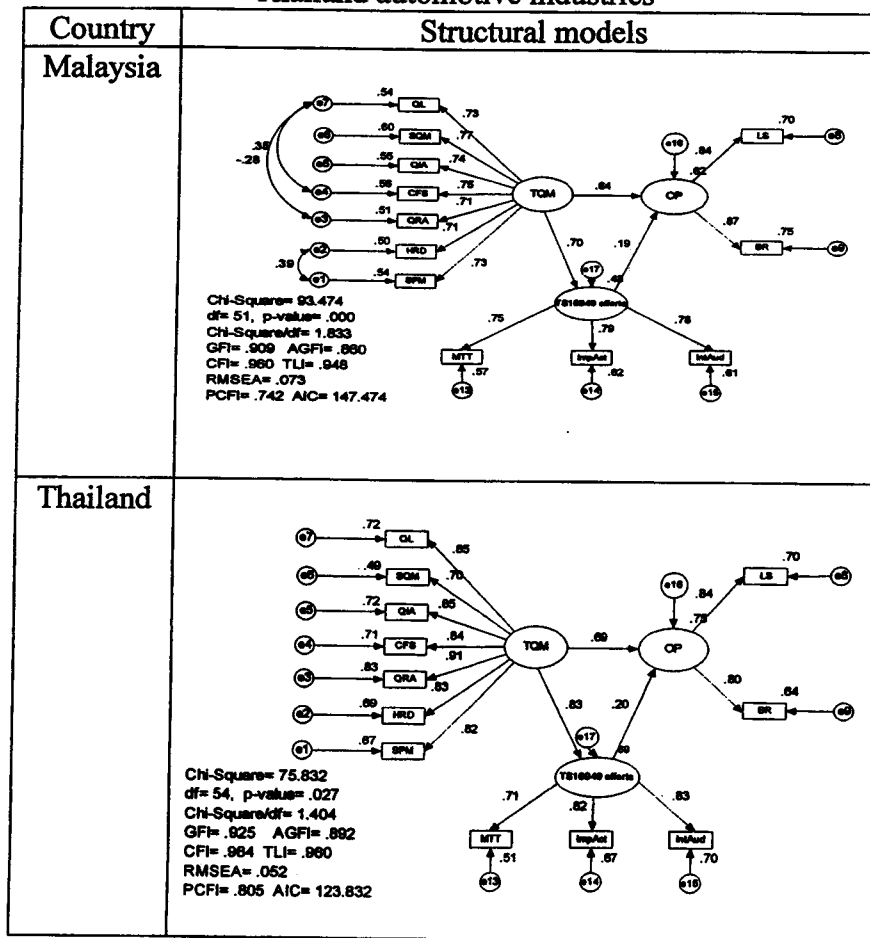


Table 4.8 Inner regression weights between latent variables in the structural model for Malaysian and Thailand automotive industries

Country	Hypothesis	Structural relationships	Standardized regression weight
Malaysia	<i>H3a</i>	TQM – OP	0.644*
	<i>H4a</i>	TQM – ISO/TS16949	0.696*
	<i>H5a</i>	ISO/TS16949 – OP	0.190
	<i>H6a</i>	TQM – OP (indirect relationship)	0.132*
Thailand	<i>H3b</i>	TQM – OP	0.693*
	<i>H4b</i>	TQM – ISO/TS16949	0.831*
	<i>H5b</i>	ISO/TS16949 – OP	0.200
	<i>H6b</i>	TQM – OP (indirect relationship)	0.166*

Note: *p < 0.001

The standardized regression weight for the direct relationship between ISO/TS16949 efforts and organizational performance was found to be positive but insignificant. However, it is surprising that ISO/TS16949 efforts do not have a strong and direct impact on organizational performance. This results contrast with the findings of earlier research which found that companies qualified with quality systems such as ISO 9000 will improve organizational performance (Poksinska *et al.*, 2002; Bayati and Taghavi, 2007).

Based on earlier discussions, organizational performance could have an indirect effect by TQM implementation through ISO/TS16949 efforts and its indirect effect was 0.132 in Malaysia and 0.166 in Thailand. The results proved that ISO/TS16949 efforts partially mediate the relationship between TQM and organizational performance in Malaysia and Thailand automotive industry with p-value 0.085 for Malaysia and 0.155 for Thailand which is more than 0.05. Therefore, it is not surprising that TQM implementation require automotive related companies to gain their ISO/TS16949 certification in order to enhance organizational performance. This study is in line with the findings of earlier studies which investigated the mediating effect of ISO 9000 and performance (Abraham *et al.*, 2000; Casadesus and Jimenez, 2000; Romano, 2000; Gupta, 2000; Withers and

Ebrahimpour, 2000; Santos and Escanciano, 2002; Martinez-Lorente and Martinez-Costa, 2004), and tends to provide a clear contribution on how TQM influences organizational performance.

4.4 IMPLICATIONS

The findings from this study have provided a theoretical and practical contribution to the literature on performance of automotive industry. These contributions are discussed in the following sections.

4.4.1 Theoretical Implications

This study offers a number of theoretical implications for knowledge enhancement in the quality management (QM) domain. First, this study extends research in the area of automotive industry performance especially in ASEAN region. As noted earlier, this study makes a contribution to filling the gap in the existing research material on ASEAN automotive industry.

Second, this study develops a conceptual model to assess not only the impact of TQM implementation to organizational performance, but also the impact of ISO/TS16949 certification to the TQM implementation and organizational performance relationship. This analysis method is call as moderating effect. On top of that, this study also investigates the role of ISO/TS16949 efforts on TQM implementation and organizational performance which is known as mediating effect. Thus, this research makes new contribution to ISO/TS16949 studies and also contribution in moderating and mediating method studies using structural equation modeling (SEM) techniques.

Finally, from theoretical perspective, in studying the perceptions of the Malaysian and Thailand automotive industries, the author has established a valuable empirical benchmark. A question addressed in our study is whether different country

affects the implementation of TQM practices such as Malaysia and Thailand. Our evidence indicates that it does. In this respect the study has contributed to the advancement of knowledge regarding comparative study in the international context especially in the developing countries. This work has contributed towards enriching quality practices in developing countries.

4.4.2 Managerial Implications

Several important implications in terms of practices emerge from the results of this study. First, although TQM implementation is highly emphasized in the quality literature, TQM alone may not create a better performance in the case of automotive industry. The result shows, if TQM implementation is coupled with ISO/TS16949 efforts, then the TQM strategy may yield better performance for the automotive industry. TQM is likely to act as a catalyst in change program. TQM by its nature is more of a bottom-up approach, while ISO program requires a top-down approach (Demirbag *et al.*, 2006). Managers may not realize an increased performance from a successful TQM implementation, but when TQM is implemented alongside ISO/TS16949, better organizational performance can be achieved. This implies that the following constructs of TQM (quality leadership, customer focus satisfaction, quality information and analysis, strategic planning management, supplier quality management, and quality results and assurance) and also efforts of ISO/TS16949 (management tools and techniques, improvement activity, and internal audit) must be planned, managed and controlled within automotive companies in order to create a competitive edge. Therefore, managers in automotive industry should consider TQM implementation and ISO/TS16949 certification as a facilitating initiative for improving organizational performance in this relatively dynamic environment.

Second, the present study corroborates previous research,

which demonstrated that quality management standards such as ISO/TS16949 have improved organizational performance if combined with TQM implementation. The findings of this study, confirmed positive effect of ISO/TS16949 program on organizational performance should be encouraging for managers. Using data from 1998 to 2002, Casadesus and Karapetrovic (2005) found that although there has been significant decrease in the perception of quality standards benefits, majority of the companies still believe that ISO series is still useful since ISO implementation and maintenance cost have substantially decreased (Bhuiyan and Alam, 2005).

Finally, the findings of the comparative study and structural analysis which is integrated between TQM implementation, ISO/TS16949 efforts and organizational performance between Malaysia and Thailand will be expected to assist managers and practitioners in automotive industry in terms of its practical significance. Since the results shows that Thailand automotive industry performance is better than Malaysian automotive industry performance, it is strongly believed that it is important for Malaysian automotive managers or practitioners to benchmark Thailand automotive industry. The findings of this research will also be suitable, effective and help Malaysian automotive industries in their effort to become more effective and competitive. Lin *et al.* (2004) suggested that the need for an examination and benchmarking of quality practices in others countries to add knowledge to the organizational performance. As a result, quality management can be used more confidently as a strategic weapon by organizations to build and sustain competitive in a marketplace.

4.5 CONCLUSIONS

There is no research attention which considers the structural relationships among TQM, ISO/TS16949 and organizational performance. The relationships of TQM implementation, ISO/TS16949 and organizational performance measures are discussed. This study show that ISO/TS16949 certification alone does not moderate the relationship between TQM implementation and organizational performance but it is found that TQM implementation have a direct effect on organizational performance and also indirect effect on organizational performance through ISO/TS16949 efforts. Particularly, ISO/TS16949 efforts play an important role as a mediating variable between TQM implementation and organizational performance in both countries, Malaysia and Thailand. The implications of the study that are related to theoretical and managerial are clearly discussed. It is concluded that TQM practices and ISO/TS16949 efforts are vital for automotive industries to achieve higher organizational performance.

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